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How to produce extracted honey

George W. Phillips

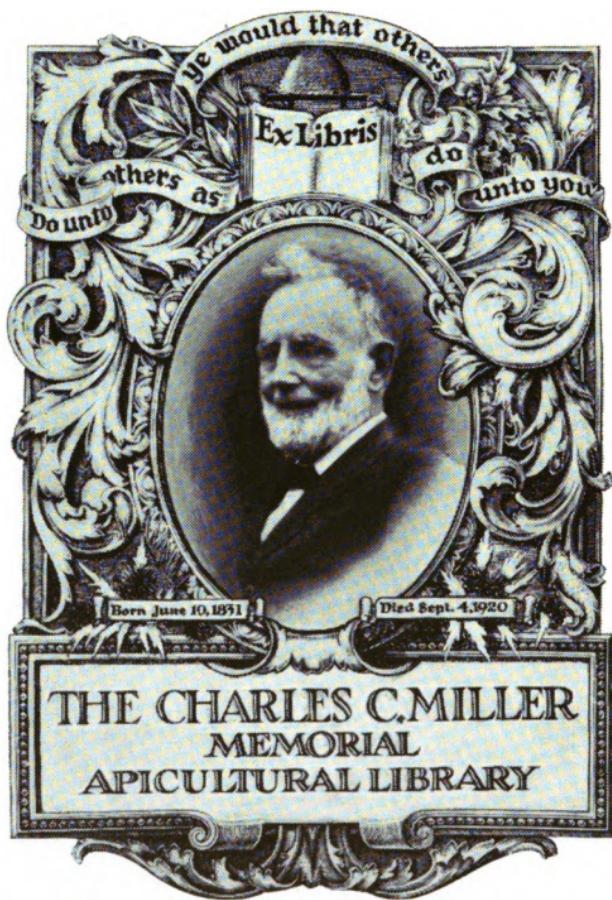
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How to Produce Extracted Honey

Second Edition

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1911



HOW TO PRODUCE EXTRACTED HONEY.

Preparing Colonies for the Honey-flow.

To produce honey, one must have a big force of bees. The productiveness of an apiary can not be measured by the number of colonies it contains, but by the number of bees in the individual colonies. The only way to achieve the best results is to see that each colony is in good working order by the time the flow opens, and to do this it is necessary to examine each separately in order to ascertain its condition. Special attention must be given to each queen and every one that is in any way defective should be replaced with another that is young and vigorous. It will never do to retain a queen whose prolificness is doubtful, for the colony which she occupies will yield very little surplus, or, in all probability, none at all. It is far better to replace such queen even if another has to be bought. The next important thing to be careful about is the strength of each colony. If the honey-flow begins a month or six weeks ahead, and the weak colonies have young prolific queens, an effort may be made to build them up to full strength in time for it; but if the flow is near at hand, it is better to unite the weaklings.

In some localities, the main honey-flow is preceded by a light flow from some other source, while

in others there is a dearth until the opening of the harvest. Where¹ the former is the case the bees will make good progress in brood-rearing and the colonies consequently will build up nicely; but where there is but one flow, the colonies are apt to be in the poorest kind of condition when it commences. To prevent this they may be fed for stimulation, thus bringing about the same condition as a natural honey-flow. However, if every colony in the fall preceding is strong and supplied with abundant stores, the bees are much more likely to be in good shape for the season than if there were scanty stores in the fall, so that feeding had to be done in the spring. The general opinion of the majority of large producers is that it is better to avoid spring feeding if possible. Of course, if any colonies are in a starving condition they must be fed; but the better way, as mentioned before, is to have strong colonies of young vigorous bees with an abundance of good stores in the fall to last until the main flow begins in the spring.

What Kind of Hive to Use for Producing Extracted Honey.

For most localities the best results will be secured in the long run with 10-frame hives of Langstroth dimensions. These may be either the double-walled pattern, or the regular dovetailed style shown herewith. Eight-frame hives are advocated by some, but they require much more attention and the average beginner, as well as expert, will get far better results with 10-frame hives, for colonies in such hives not only swarm much less, but they produce

more honey per hive. In certain instances the divisible-brood-chamber hive may be used with good results, but a special system of management is re-

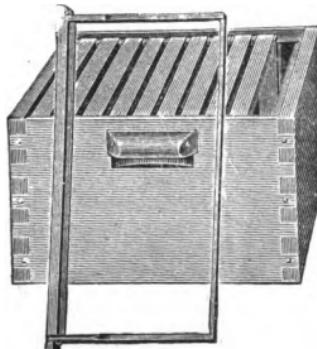


Fig. 1. Dovetailed Hive Body Holding 10 Hoffman Frames.

quired; and, taking it all in all, it is very doubtful whether the average person will get anywhere near as good results with such hives as with those having deeper frames, of the Langstroth dimensions.



Fig. 2. Shallow Extracting Super.

The supers that go above the brood-chamber to hold the surplus honey, may either be of the shallow

type, in which frames are used about half the depth of Langstroth frames, or, they may be similar in dimensions to the brood-chamber, the frames used being identical with the brood-frames. There are advantages and disadvantages in both, and it rests with the individual as to which kind is best. Briefly, we may say that the shallower supers are coming more and more into use. They are much easier handled; they do not provide more room at a time than a colony needs; there is no need of wiring the combs in the shallow frames to prevent breakage in the extractor and last but not least, the combs in the shallow frames are easier to uncaps.

The advantages of the deep supers are as follows: The frames used are interchangeable with brood-frames, and, at times this, of course, is quite a convenience. Many have said that when it comes to extracting the honey, since there are only about half the number of frames to handle, as the deep frames are nearly twice the size of the shallow, the work is more quickly done.

In our own apiary we use the shallow supers, and, as we said before, we find an increasing number of producers are beginning to use them also. In either case it is best to space the frames further apart than they are spaced in the brood-chamber; that is, even though self-spacing frames are used, in extracting-supers it is best to remove two of the frames, so that the eight remaining ones can be spaced further apart. This will result in good fat combs that can be more easily uncapped than those that are spaced more closely together, so that the combs are thinner.

Putting on Supers.

We will assume that the colonies are in good shape for the honey-flow. The next thing is to put on supers. Many make the fatal mistake of waiting until the last minute before purchasing their supplies. It is folly to go to the expense and trouble of establishing an apiary and then when the time arrives to reap the reward of the labor, to lose it all simply because the goods have not come. Long before the harvest opens, the supers should be put together and painted, the frames nailed up, supplied with full sheets of foundation, etc. If the deep frames of Langstroth dimensions are used, they should be well wired to prevent comb breakage in the extractor; but with the shallow frames the wires are not necessary.

The supers should not be put on before the bees are ready for them, as nothing is gained and it is harder for the bees to keep up the necessary heat, especially in cold climates. On the other hand, the putting on of supers must not be delayed too long, for thus time would be wasted. As soon as there are indications of honey coming in from natural sources in such quantities that the tops of the combs in the brood-nest begin to whiten, it is time to put on the supers. The tendency of some Italian bees is to store the honey in the brood-nest to the exclusion of brood. We have seen colonies whose brood-nests were packed with honey almost to the total exclusion of brood, while little or no work was being done in the supers. In such cases it is advisable to keep swapping combs, that is, placing full combs of honey from the brood-nest in the super and then putting

empty combs or frames of foundation below, to give the queen an opportunity to lay. The combs of honey in the supers act as baits to induce the bees to go above. When bees get well started in the supers, however, as little exchanging or handling should be done as is consistent with successful management of the colony, for every time a hive is pulled to pieces the bees are hindered in their work and honey is lost.

A better way is to prevent the brood-chamber from becoming clogged with honey instead of trying to remedy the difficulty afterward. If the queen is young and prolific and of a good strain, she will

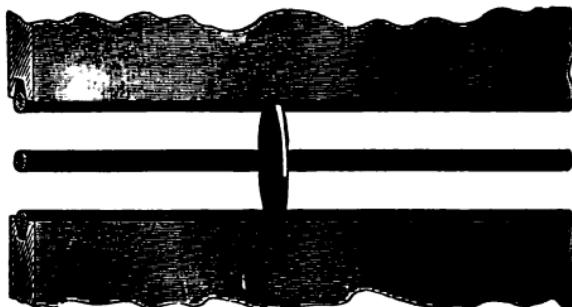


Fig. 3. Wire Queen-excluders. Full Size.

keep the brood-chamber so full of brood, that by the time the main flow begins there will be very little room for storage of extra honey. If the brood-chamber does get clogged with honey it shows that either super room has not been provided, soon enough, or else that the queen is no good.

There are some who advocate the non-use of queen-excluding honey-boards between the brood-chambers and supers, but we strongly advise them

for the production of extracted honey, for otherwise the queen is likely to go up into the extracting combs and instead of nice white honey comb, there will be a mixture of brood in all stages, pollen, drone and possibly queen-cells. By special management the queen may be kept out of the supers after the flow begins, even though no excluders are used, but 99 out of 100 who attempt this will fail. It is not

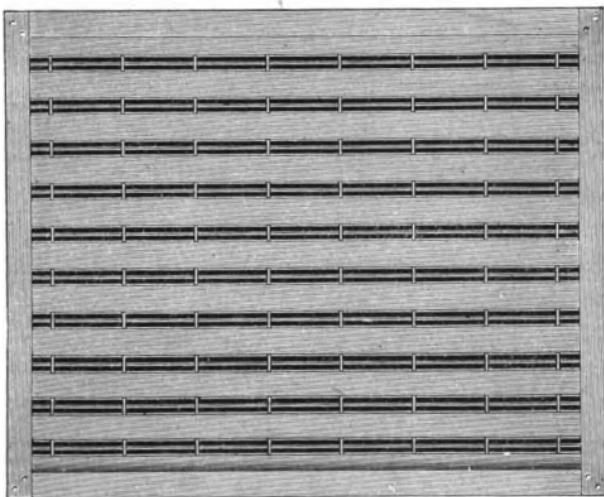


Fig. 4. Wood Wire Queen-excluding Honey-Board.

necessary to state that honey extracted from combs containing unsealed brood is hardly fit for table use. Furthermore, the queen, if allowed in the supers will be in a most dangerous position and will stand a chance of being killed every time the extracting combs are handled. It is also a very difficult matter to find a queen if no excluder is used, for there would be so many more combs to look over. This

would also be true in reference to the finding of queen-cells at swarming time.

One of the greatest objections to the non-use of the queen-excluders is that it is impossible to use that great labor saver, the bee-escape. It is plain to see, that, if there is any brood in the supers, the bees will not desert it and go down below. On one occasion, when in the height of extracting, we recollect seeing a queen and her attendants placidly located on a large comb of honey, apparently taking in the situation. The colony had had no queen-excluder over the brood-chamber and the queen was in the super when the escape was put on. It was next to impossible to tell what hive she belonged to, and the whole proceeding meant extra work and worry that would have paid for many excluders. Therefore, a queen-excluding honey-board should go on the brood-nest.

The objection that used to be made by some to the use of queen-excluders was that they obstructed the passage of the bees into the supers, but with the new wood-wire construction this is entirely obviated.

As soon as the first super is filled and the process of sealing has begun, remove it, put an empty one in its place, and over it put the nearly completed one. The colony will then be occupying a hive of three stories, in case full depth supers are used, or approximately two stories, if the shallow supers are used. Always put the empty super nearest the brood-nest as the bees start to work in it more readily, and, as it is nearer, they have a shorter distance to travel. After the first extracting the empty combs can be put back again and it will be found

that the filling and sealing is done much more rapidly the second time, as the combs are already drawn out and the bees do not have to waste any time in comb building.

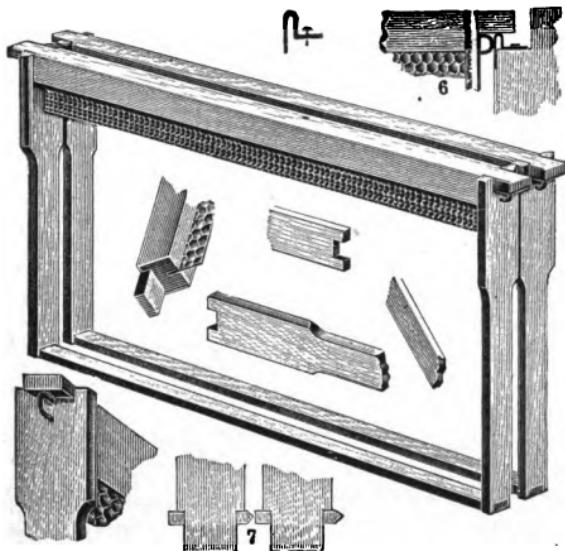


Fig. 5. Hoffman Frames. Regular.

We have already mentioned the advisability of spacing the combs further apart in the supers than in the brood-chambers, on account of the greater ease in uncapping the thick comb. Ordinarily, eight combs should be placed in a 10-comb super, the space between being regulated so that it is just the same. If this is not done, a part of the combs will be no thicker than ordinary brood-combs while others will be entirely too thick, or else the bees may possibly build natural combs in between the frames. Let no one get the idea that in order to

space frames further apart, non-spacing frames should be used, for the regular Hoffman frame is the best under all conditions. In localities where propolis is very plentiful, the metal-spaced Hoffman frame is desirable, although it requires a little more care in uncapping the metal-spaced frame to avoid

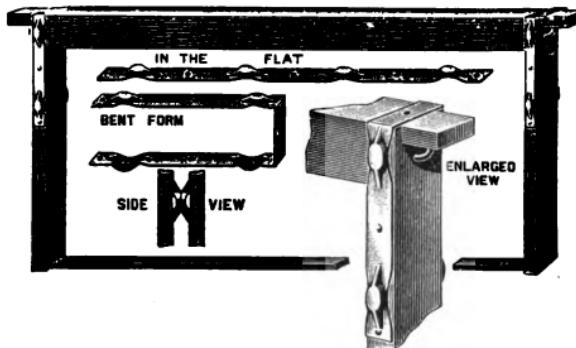


Fig. 6. Hoffman Frames. Metal Spaced Pattern.

dulling the uncapping-knife. The regular Hoffman frame, then, should be usually used in the super, although the metal-spaced type is always better in the brood-chamber where propolis is plentiful.

The Control of Swarming.

The extracted-honey producer does not have as much trouble preventing swarms as does the comb-honey man, since there is no objection to giving plenty of room as fast as the bees need it, and perhaps a little faster. In some localities bees swarm before and in others during the honey flow,—and in a few localities they swarm after the flow is almost over; but, in any case, swarming is a hin-

drance to the best results in honey production. Bees which should be working with concentrated energy in one hive if divided into half a dozen diminutive swarms, are generally of no use to themselves or to the bee-keeper, so far as the production of surplus honey is concerned, and supers which would otherwise have been well filled, are almost entirely emptied of what they may already contain in order to supply provender for the new swarms.

It will be seen, then, that in order to get good results, swarming must be kept under control and at the same time the colony kept strong. This may be accomplished by the shaken or brushed-swarm plan, which, briefly explained, is as follows: As soon as a colony shows symptoms of swarming, the brood-nest is taken away and another one substituted in its place, with frames of foundation instead of combs. Over this the queen-excluder is placed and then the supers that were on the original brood-nest. The bees from the old brood-nest are shaken in front of the entrance of the new one, care being taken that the queen runs in with the rest, for, if she is missing, the colony will be hopelessly queenless. The bees will then go right to work fixing up the new brood-nest and the storing of honey will continue as though nothing had happened. The shaken swarm should never be given any brood whatever; the brood from the old hive may be distributed among weak colonies, or it may be left near the old stand with a few bees to take care of what is unsealed, the entrance of the old hive being turned in the opposite direction. At the end of three weeks, at which time all of the brood will have hatched, the bees may be dumped in front of the old stand and

made to unite with the bees first shaken into the new hive, thus the desire to swarm or change hives will be satisfied and yet the original force of bees is left to work with concentrated energy in one hive.

A plan for preventing swarming and making increase, that has been used quite extensively all over the country, is known as the Alexander plan for making increase. This plan, given in Mr. Alexander's own words, is as follows:

When your colonies are nearly full enough to swarm naturally, and you wish to divide them so as to make two from one, go to the colony you wish to divide; lift it from its stand and put in its place a hive containing frames of comb or foundation, the same as you would put the swarm in providing it had just swarmed. Now remove the center comb from this empty hive, and put in its place a frame of brood, either from the hive you wish to divide or some other colony that can spare one, and be sure to find the queen and put her on this frame of brood in the new hive; also look it over very carefully to see that it contains no eggs or larvae in any queen-cells. If it does, destroy them. Now put a queen-excluding honey-board on top of this new hive that contains the queen and frame of brood with their empty combs, then set your full queenless colony over the excluder; next put in the empty comb or frame of foundation, wherever you got your frame of brood, and close the upper hive except the entrance they have through the excluder into the hive below. Now leave them in this way about five days, then look over the combs carefully, and destroy any larvae you may find in the queen-cells unless they are of a good strain of bees that you care to breed from, for they frequently start the rearing of queens above the excluder very soon after their queen was placed below the excluder. If so, you had better separate them at once; but if they have not started any queen-cells above, then leave them together ten or eleven days, during which time the queen will get a fine lot of brood started in the lower hive, and every egg and particle or larva that was in the old hive

on top will have matured, so it will be capped over and saved, then separate them, putting the old hive in a new stand. It will then be full of young bees mostly, and capped brood and in about twenty-four hours they will accept a ripe cell, a virgin, or laying queen, as they will then realize that they are hopelessly queenless. I would advise you to give them a laying queen, as I never like to keep my full colonies for even a day longer without a laying queen than I can help. In this way you have two strong colonies from one, as you have not lost a particle of brood nor checked the laying of your queen, and with me it almost wholly prevents swarming. This is the way we have made our increase for several years, and we like it much better than any other method we ever tried. In doing so you keep all your colonies strong during the whole summer, and it is the strong colonies that count in giving us our surplus.

The following is another good plan for controlling swarming, but without making increase: Remove the brood-nest of the colony that is expected to cast a swarm and place its upper stories or supers on the bottom-board in its place. Put the removed brood-nest immediately behind the stand it formerly occupied, turning its entrance in the opposite direction. The field bees, not knowing of the change, will return to the old location and go directly into the supers. Thus we shall get the workers just where they are wanted and at the same time the strength of the brood-nest proper will be so reduced that all ideas of swarming will be given up and in most cases the bees will destroy all queen-cells already started. In eight days the brood nest can be returned to its former position and the supers placed on top, as at first. In many instances no further idea of swarming will be contemplated. During the time that the colony is divided a laying queen should be caged in the queenless portion in order to keep the bees quiet.

Removing Honey From the Hives.

We will assume again that the colonies were in good condition for the flow, that swarming was kept well under control, and that the supering was done judiciously so that now the attention may be turned to extracting. It is well to look over all of the upper stories and mark those which contain sealed honey. Bee-keepers, especially beginners, often like to rush matters and extract honey that is unsealed. This is one of the worst moves possible, for if green honey is sold, it will in all probability cause the loss of reputation with the wholesale honey dealers, as well as with the local trade.

It is not always necessary to wait until the end of the flow before extracting, as it is sometimes advantageous to extract all ripe honey, that is, all honey that is sealed, before the end of the flow, as at that time there is no robbing to contend with since the bees are busy and the combs extracted will be ready for putting on again and getting refilled. As long as the honey-flow lasts, only that which is well sealed should be extracted, the partly sealed combs being left until after the flow, in order to get the honey in the cells ripened as much as possible. We may mention here that some large extracted honey producers prefer to leave all honey on the hives as long as possible, claiming that by so doing they get a much thicker and better grade. This is a very good plan for localities where there is no dark honey-flow soon after the light flow. Where dark honey comes in soon after the light, or where there is a mixture of honey, it is better to extract the combs as soon as they are sealed in order to

keep the different kinds of honey by themselves as far as possible. When the flow is over and all the honey is removed, the combs should be carefully sorted, all the unripe honey extracted by itself and used for feeding, or sold for manufacturing purposes. Such honey should never be used for the table.

If the honey is extracted as soon as possible after it is removed from the hive, it is warm, so that in the extractor it is thrown out of the cells quickly; on the other hand, if it is allowed to remain on the hives, then removed and stacked up in the honey-house and extracted at a later date, it will be colder and will consequently take more time to extract. However, it is the opinion of some of the largest producers that it actually pays to extract the honey all at once, or as much so as possible, since at that time work is not so pressing and more time can be given. Of course, if the supers are stacked up on the hives until the end of the flow it requires more extracting-combs and more supers to hold them, than if each comb is extracted about as soon as sealed.

How to Free the Combs From Bees.

There is no question but that it is easier to get the bees from shallow combs than from the full-depth combs. Smoke may be used in either case, although better results follow from its use on the shallow combs since there is more of a chance for the smoke to go down through. Some follow the plan of giving a vigorous smoking and raising the supers and blowing smoke through between the

combs to get out the last few bees. The combs then need but very little brushing to render them practically free. Each comb as it is brushed should be placed in another empty super near by and finally when the combs are all out, the super just emptied should be taken to the next hive to use in the same

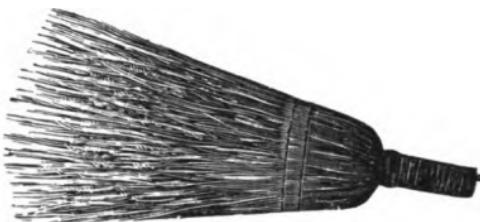


Fig. 7. Coggshall Bee-brush.

way. There is more or less objection to the use of smoke, one being that the bees are likely to uncap the honey to some extent, although this is not so important in extracted honey production as in comb honey production. The greatest objection to the use of smoke is that it is quite slow and



Fig. 8. German Bee-brush.

uncertain in results, and furthermore the honey is sometimes tainted a little with the smell of the smoke, especially that which is sliced off with the cappings. On this account some prefer to use practically no smoke, depending almost entirely on brushes for getting the bees off, each comb being

taken out by itself, both sides brushed quickly and then set into the empty super waiting. A large feather is sometimes used, but feathers irritate the bees and it is better in the long run to use a brush especially for the purpose. The Coggshall bee-brush, shown in the adjoining view, is perhaps the best that can be found for the purpose, although the German brush is also very good. It is probable that a combination of both the smoke and the brushing is better than either one alone; but it must be remembered that all this work, if done during a time when no honey is coming in, must be carried on



Fig. 9. Porter Bee-escape.

very rapidly and the super and all the honey kept covered up every instant in order to be kept away from robber bees. When robbers once get to following the operator around the yard it becomes very troublesome indeed, and the best way is to work quickly and go from one place to another so rapidly that they do not get a chance to start.

By far the easiest and nicest way to free supers from bees, is to use the Porter bee-escape, shown in the engraving. This is a little device, which, when placed in a board between the supers and the brood-chamber, allows the bees to pass down through into the brood-chamber but prevents them

by means of delicate steel springs inside from getting back up again. These escape boards if placed under the supers in the afternoon will almost entirely free the combs of bees the following day. Sometimes more time is required, but usually this is enough. The honey is then removed without knowledge of the bees, there is no danger of robbing,

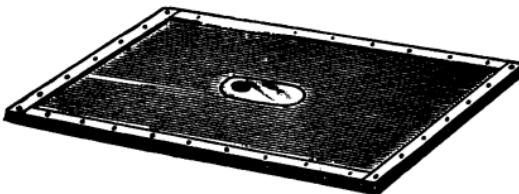


Fig. 10. Porter Bee-escape on Board in Position for Use.

no stings, no loss of time and no disturbance. There is not even any need of using a smoker. If the colony has two supers and the upper one only is ready to come off, the escape should of course be put between the upper and lower super, so that the bees will not be prevented from working in the super not yet finished.

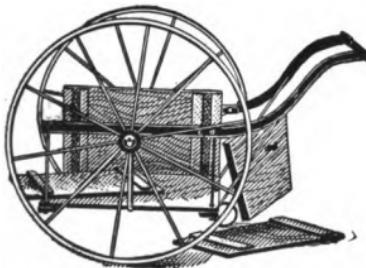


Fig. 11. High Wheeled Apiary Cart.

In most localities a wheelbarrow or cart with two high wheels, is the handiest implement that can

be used for carrying supers of honey to the honey-house. However, in certain apiaries the ground is so rough, or there are so many trees, or other obstructions, that neither a wheelbarrow nor cart can be used and in such instances there is practically no way but to carry the combs of honey in a suitable box, with a good strong handle. Metal comb-carriers with a bee-tight cover, are very handy for this

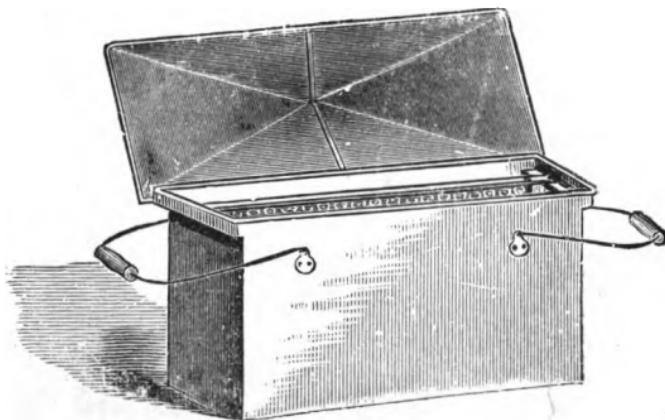


Fig. 12. Comb-bucket.

purpose, as shown in the illustration. The importance of keeping all combs away from the bees during a time when honey is not coming in, must not be lost sight of, as a little carelessness here will make all kinds of trouble.

Apparatus Needed in the Honey-house.

Any good, bee-tight building will answer for this purpose, although it must be large enough to hold the necessary machinery, the supers of combs ready to extract, and in some instances the cans of honey

that have been extracted, although in most cases it is better to store the honey in some other place and not fill up the extracting room in this way. The windows should be large, so as to admit plenty of light and air, and it would be better if they could be

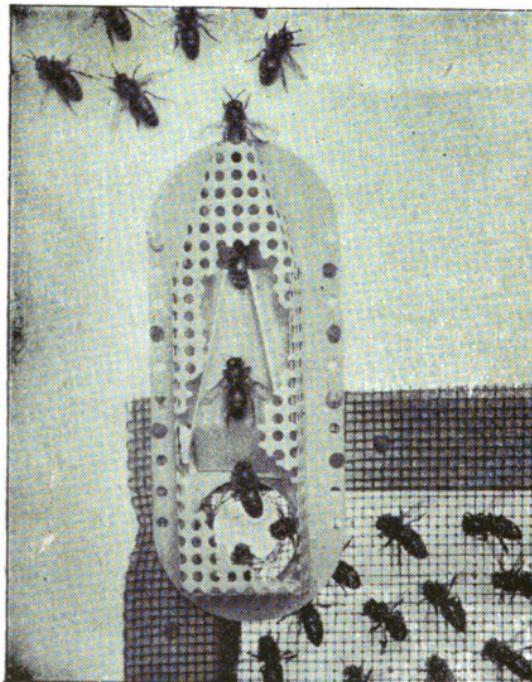


Fig. 13. Escape in Position on Honey House Window.

so arranged as to be removed entirely, wire cloth screens taking their place. On the outside of the upper corners of the windows, honey-house escapes made on the same principle as the hive-escapes before mentioned, should be attached, so that the few bees taken into the room on the combs, will go at

once to the windows and make their escape. The door of the building, instead of being made of screen, had better be solid, so that the bees will not be attracted to it and interfere with the operators going in and out. The bees attracted to the building, then, will ordinarily be flying around the open windows, instead, leaving the door comparatively free from bees.

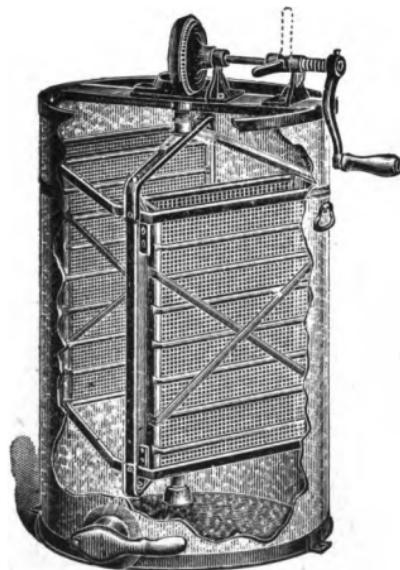


Fig. 14. Two-frame Reversible Honey Extractor.

One who does not own a bee-tight building might do the extracting in any kind of an open shed at night, but it is necessary to clean everything up thoroughly in the morning or else the bees will take possession and make it very difficult to do any kind of work the next day.

In considering the apparatus needed for extracting honey, we are aware that no one list of appliances will do for all conditions, almost every producer having his own ideas as to what he wants, and it is of course impossible in the brief space allowed in this booklet to mention all of the different kinds of apparatus used.

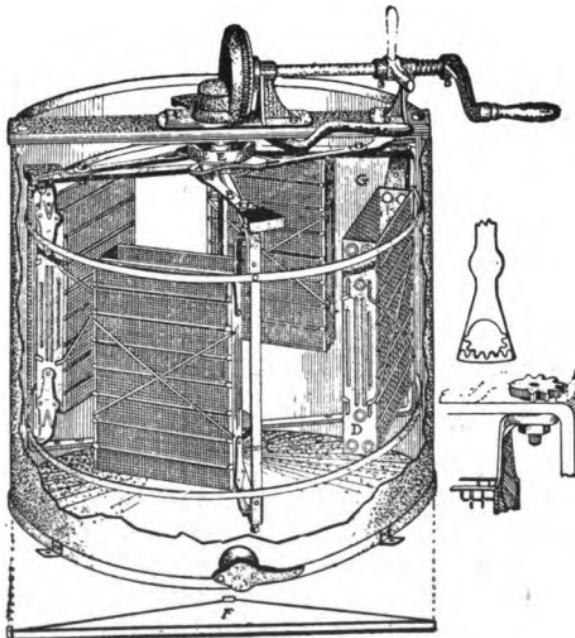


Fig. 15. Root Automatic Extractor. Pat. April 11, 1905,
and Patents Pending.

The extractor should be selected according to the requirements and size of the apiary. For a small yard of say twenty or thirty colonies a two-frame extractor is large enough, but for convenience it should be made reversible, so that the baskets may

be swung around to the other side to extract the other side of the combs. We do not recommend the two-frame automatic extractor as there is little if any advantage gained by its use, since the two

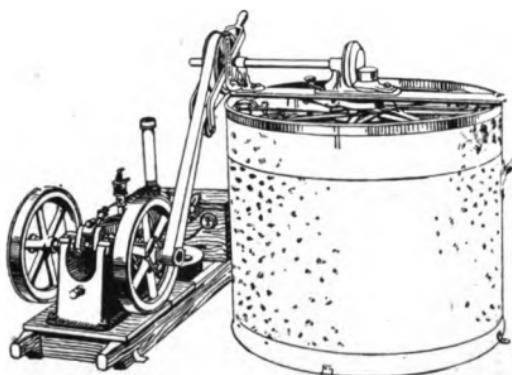


Fig. 16. Gasoline Engine and 8-frame Automatic Extractor.

baskets for the combs can be so easily reversed by hand. But the four-frame non-reversible extractor is much simpler than the two-frame reversible, and it is, besides, very small and compact, and therefore just the thing for hauling from one out-yard to another. For a larger number of colonies, the four, six, or eight-frame automatic reversing extractor is the one to select, the two latter sizes requiring power for turning, such as a gasoline engine, for they are too heavy to turn by hand except in an emergency. The large extractors have a great advantage over the small ones in that the combs can be kept in motion so much longer. For instance, in the large size, eight combs can be kept going until eight more have been uncapped and of course this

longer time than is practicable say, with a four-frame machine, means that the combs are extracted just that much cleaner. Any honey left in the cells is wasted.

For further particulars in regard to gasoline engines and power extractors see our free booklet, "Power Honey Extractors."

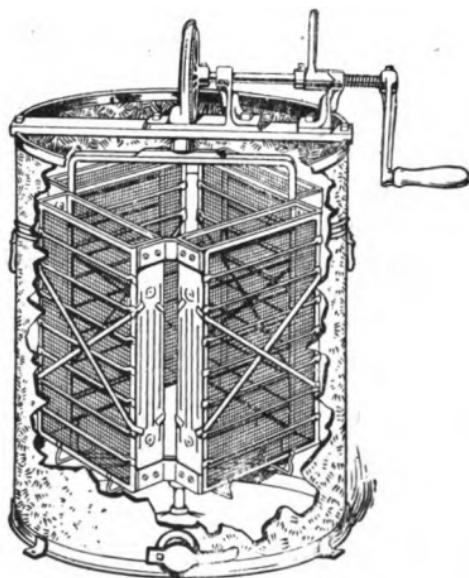


Fig. 17. Four-frame Non-reversible Extractor.

If possible, instead of elevating the extractor on a platform a foot or so high, it is a very good plan to cut a hole in the floor underneath the gate of the extractor, making a pit into which a large pail may be set, to catch the honey. This allows the extractor to stand on the solid floor, and no one who has not tried it can realize the convenience of the

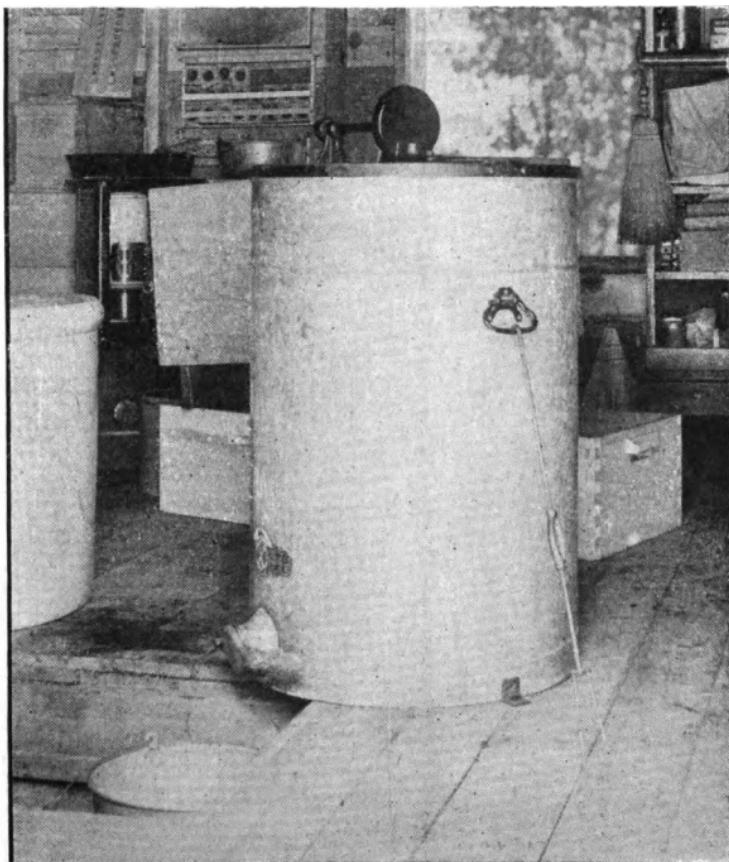


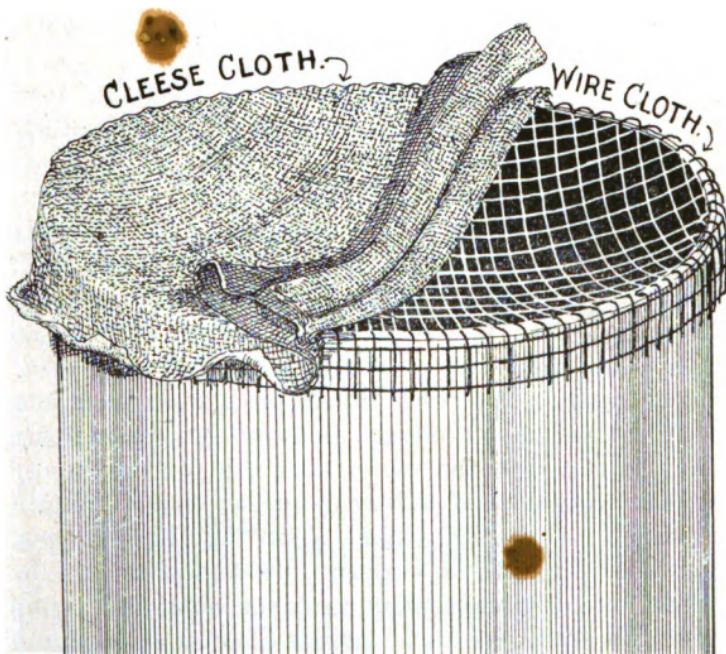
Fig. 18. Pit cut in Floor for the Pall under the Extractor.

plan. When the machine sets down on the floor it is much easier to get the combs in and out and a great deal of time is saved. Of course, if there is a basement to the extracting-house or to some other building close by into which the honey can be run through a pipe into a tank, so much the better.



Fig. 19.—DETAIL OF POWER EXTRACTOR. To start the extractor, push down on the handle A. This removes the idler, B, up, tightening the belt up so that the reel begins to turn. To reverse the basket, release the idler and pull on the brake-lever, E, thus tightening the band, F, and causing the reversing-hub to move slower than the reel. This difference of speed in the motion of the hub and the reel reverses the baskets. P. S.—Pull on handle A, drawing pin from slot in curved ratchet. When in position, release handle, and spring engages pin in nearest slot. See that all bearings are oiled.

Most bee-keepers strain the honey as soon as it is extracted, using cheesecloth tied over the top of a large can. As the cheesecloth very soon becomes clogged with bits of cappings, combs, etc., it is well to provide means for changing it quickly

**METHOD OF HOLDING A CHEESE CLOTH STRAINER**

Instead of tying the cloth around the top of the can, heavy wire cloth is used to support it.

and we know of no better plan than the use of a large piece of heavy wirecloth placed over the top of the can and secured firmly in place. This should be pushed down into the can somewhat so as to

allow greater space for the honey. Cheesecloth may be laid over the netting and the honey poured on it, then when one cloth is clogged it may be drawn to one side, where it may drain, and another cloth placed in position, and the work continued without delay.

Of late, quite a number of producers have been advocating the settling tank for clarifying honey. In brief this plan is as follows: A large tank is used that will hold all the honey from a day's extracting. In case the work is to be done in cool weather, as in the fall, it would be better to have two such tanks. The honey is poured into the tank, no effort being made at all in straining it, and at night it is covered up and allowed to stand until the next day, when the clear honey may be drawn off at the bottom, all the specks, bits of cappings, wax, etc., having risen to the top. These, by the way, should be skimmed off as much as possible, before the honey is run into the cans. The last of the honey can not be drawn off in this way, for it will contain too much of the cappings. The last few inches, therefore, should be dipped out and strained or poured into the uncapping tank, or box. All tanks should be elevated high enough so that a 60-pound can with funnel, may be set underneath and they should be provided with gates at the bottom of large size. In extracting-houses on a large scale, three or four thousand pounds may be extracted in a day, so it pays to have the tanks of ample size to keep up with the extractors in case the honey is clarified by the gravity plan.

It takes more time to strain the honey, but a much smaller tank may be used if desired, for the

honey is generally run into cans immediately after it is strained.

The knives used in slicing the cappings off the combs must be especially made. Large size butcher knives may be used, but, ordinarily, these do not

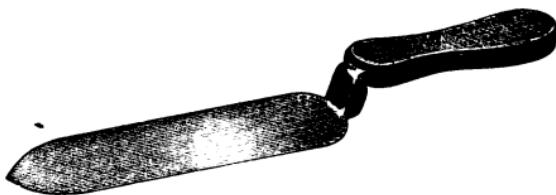


Fig. 20. Improved Bingham Honey-knife.

give very good results. We use and recommend the heavy Bingham knife for we have never found anything that comes anywhere near it in effectiveness.

For the most rapid work and especially for combs that are new and fragile, the steam-heated uncapping-knife is by far the best. It keeps itself clean



Fig. 20. Steam Uncapping Knife.

and melts its way through the honey like "greased lightning". It requires far less strength to uncap with the hot knife than with plain cold knives. Some bee-keepers keep a pail of hot water handy, over an oil or gasoline stove and use several knives, always selecting a hot one from those that stand in the water. This plan gives better results than the plain cold knife, for knives have to be washed quite

frequently anyway; but the steam-heated knives are away ahead of even these.

Since considerable honey is removed with the cappings it requires quite a little apparatus to hold

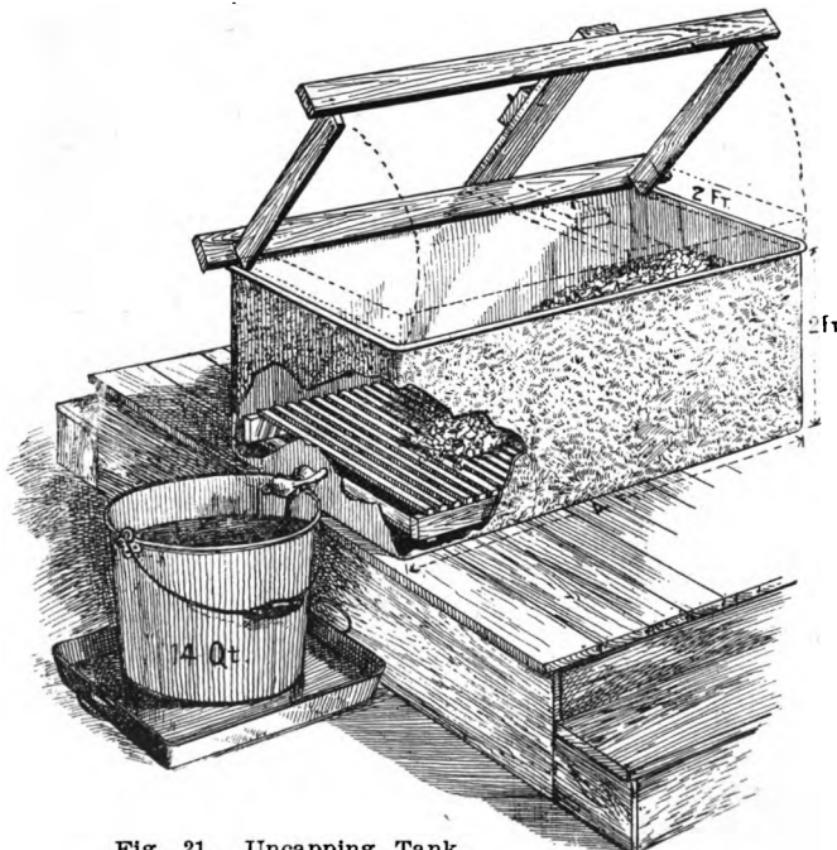


Fig. 21. Uncapping Tank.

the cappings and honey. Some prefer to use a capping-melter which melts the wax and separates it from the honey immediately, while others use

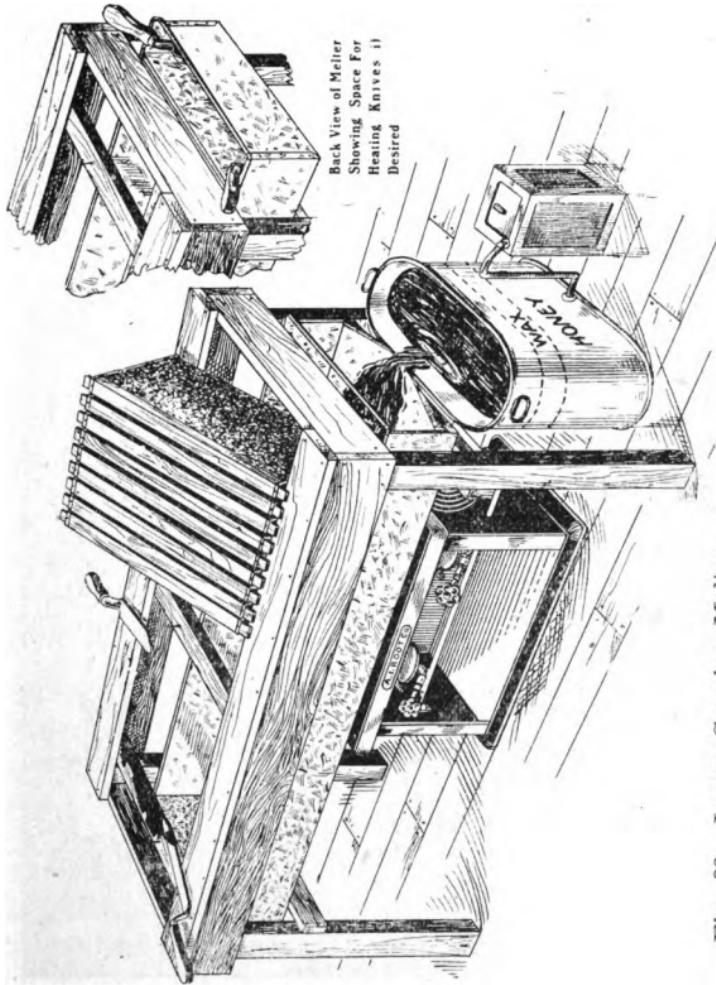


Fig. 22. Large Capping Melter.

large steel tanks with screen at the bottom, on which the cappings fall, so that the honey drains out, leaving the cappings nearly dry. The objection to this plan is that it is impossible to remove all of the honey in this way and considerable is lost. Furthermore, the work is very slow, as honey keeps on dripping for a very long time and the receptacle soon gets full of cappings and honey. The capping-melters melt the cappings at once, so that the wax and honey may be separated immediately. The objections to the capping-melter are that a two-burner oil or gasoline stove has to be used in most cases and some dislike this on account of the heat. It is impossible, however, to handle cappings and honey without some inconvenience. If an uncapping can is used, it must have capacity enough to hold the cappings for a whole day's run, preferably; and, on the other hand, if a capping-melter is chosen, it must have surface enough to melt the cappings as fast as one and sometimes two operators can slice them from the combs.

In any extracting-room several good, strong, galvanized iron pails are necessary, provided with handles that are capable of bearing the necessary strain.

Full details in regard to capping-melters, steam honey-knives, etc., are also given in the free booklet, "Power Extractors", above mentioned.

Extracting.

If the honey is to be extracted as soon as brought from the hives, not less than three people should attempt the work; one to remove the honey from

the hives and carry it to the honey-house, one to uncap and the other to extract. In order to uncap a comb, one end-bar should be placed on the nail point in the framework over the uncapping-can or melter, as the case may be, which point will hold it firmly and allow the frame to be turned around to expose the other side. Some operators commence at the top of the comb and cut down, but we prefer to begin at the bottom and draw the knife up, as we have found this the easier plan. In either case, the frame should be kept tipped enough so that the cappings as they are removed will not fall back onto the uncapped surface, but down into the receptacle beneath. When uncapping with a cold knife, too much pressure should not be exerted, as the delicate comb is likely to be torn and mutilated. A forward and backward motion is desirable as though the knife were a saw. One should not be content to peel off the cappings a little at a time,—as wide a surface as possible should be removed by each stroke and in most instances the entire side of a fully sealed comb may be sliced off without once removing the knife. It is now that the advantage of the wide spacing in the hive is seen, for combs that are very thick are very easy to uncap. Thick combs should be uncapped down to the top-bar, no particular effort being made at removing a thin layer. Thin combs are more difficult to uncap, as less can be removed. With thin combs it is well to hold the frame always in such a position that the bottom-bar is nearest the hand that holds the knife. This means that after one side of the comb is uncapped the other end will have to be placed on the pivot, otherwise the top-bar will be somewhat

in the way. For thick combs it is not necessary to change the combs end to end each time, as the top-bars are then not in the way.

In placing the combs in the extractor it is well to avoid placing a very light comb opposite a very heavy one, as this would tend to throw the reel out of balance, making the extractor strain at its moorings. This reminds us that the extractor must be very firmly anchored to the floor, or platform, as the case may be, to prevent it from jumping around when the reel is turned at a high rate of speed.

When using shallow extracting-combs, an extractor is ordinarily used having extra wide baskets, so that two of the shallow combs can be placed in each basket. With the deep combs of Langstroth dimensions only one is placed in a basket.

In the automatic extractors the hinges should follow the baskets in the direction of revolution and when the honey is thrown out of one side, so that practically no more comes out, the brake should be applied gently, so as to bring the reel nearly to a stop. Just before it slows down to a stop, the brake handle should be pulled a little harder and the baskets will automatically reverse, so that the reel can be speeded up again before it comes to a full stop and the honey extracted out of the other side of the combs. If the honey is very thick and cold and the combs fragile, it is sometimes better to extract a little honey out of each side of the combs before getting the reel up to full speed, otherwise there would be danger of comb breakage.

After the honey is out of both sides and the empty combs removed from the baskets, grasp the brake lever of the extractor with the right hand and

one of the braces of the reel with the left hand and push the reel around in a direction opposite to that which it is ordinarily turned. This will again reverse the baskets back to the original position ready for another set of filled combs.

The directions given above are for operating the four-frame Root automatic honey-extractor, although they apply equally well to the six, eight or twelve-frame extractors, as the operation of the mechanism is just the same. A two-frame automatic-reversible extractor operates also on the same plan, but, as we mentioned before, we do not recommend this extractor. It is much more complicated in operation than the automatic four, six or eight-frame extractors. The two-frame hand-reversible extractor is slowed down to a stop and the baskets swung over by hand,—there being only two of them this is very quickly done. The two and four-frame Novice extractors are non-reversible, and the frames have to be lifted out and turned around instead of turning the baskets around. The non-reversible machines are intended primarily for portable machine outfits that are hauled from one out-yard to another. They are not as convenient, nor as rapid, of course, as the reversible machines.

Some mention should be made of the proper method of drawing honey off the bottom of the extractor through the gate. Some follow the plan of leaving the gate open all the time with a pail or can underneath, but this is very bad practice, for in spite of great care, one will forget, occasionally, and the pail underneath will run over, wasting a lot of honey and requiring much time when time is worth the most. The gate of the extractor at

the bottom should be kept closed all the time, except when the level of the honey gets almost to the bottom bearing of the reel; then a pail should be set underneath, and the gate opened wide. The depth of honey in the extractor will provide enough pressure, so that the pail will fill very quickly indeed, and during this time the hand should not be taken from the handle of the gate, but as soon as the pail is full the gate should be shut and then the honey poured into the settling tank. Another pailful or so may be drawn off in the same way and then the extracting continued until the level reaches the high point again.

There should be suitable racks to hold the uncapped combs before they are ready for the extractor and to catch the drip from them. If a capping-melter of the long type is used, there is plenty of room at one end of the table for these dripping combs to rest. The same is true if a long uncapping-tank is used. It pays to provide a space in this way for a number of combs so that the person uncapping may get enough ahead at times to enable him to tend to other work occasionally, such as re-arranging supers of honey to better advantage, etc. Care must be taken to provide conveniences that will facilitate the work and not hinder it.

The combs, as soon as they are empty of honey, may be removed from the extractor and replaced in the supers ready to go back on the hives again, or, for storing, as the case may be. It is seldom a good plan to put the empty combs back on the hive as soon as the honey is extracted from them, for they are liable to incite robbing. We advise put-

ting the combs back in the evening, as the bees will then have time to clean them during the night so that by morning the chances for robbing will be very remote.

We do not advise one person to do all the work inside the extracting-house, that is, the uncapping, extracting, etc., for he can not begin to work half as fast as two people can. However, at certain times one has to do it all and the plan of operating is as follows: Enough combs should be uncapped to fill the extractor, then the machine started with the hinges following the baskets, if the automatic extractor is used. The reel should be turned slowly at first and then the speed gradually increased. At full speed, the gear should be slipped by pulling on the lever on the gear-bar and the reel allowed to whirl noiselessly by itself; then half enough combs to fill the extractor again should be uncapped, and by that time the honey will be practically all out of the first side of the combs in the extractor. After this the reel should be reversed by pulling on the brake-lever, and as soon as it is again going full speed, the gear slipped, when enough more combs to fill the extractor may be uncapped. By this time the honey will be practically out of both sides of the comb. In case it is cold and very thick perhaps the operation will have to be repeated in order to get the cells dry enough.

The advantage of the power extractor comes in here. If the honey is somewhat thick and cold it is very difficult to get it all out of the cells by hand, for it requires long continued high speed to get the last bit of honey out. Those who have used power extractors have been very much surprised at the

greater amount of honey which they obtained, for if some honey is left in the cells, the bees are so excited by it that it is largely consumed so that it does no good when put back on the hives. If this much is saved it is just that much more to the credit of the apiary. As mentioned before, we have a special booklet which describes the power extractors, gasoline engine, etc., which we will be glad to send to anyone on request. It goes into the matter of power extractors very fully, shows how to use them, shows all the advantages, etc. We have been supplying gasoline engines now so long that they are no longer an experiment and even bee-keepers with small apiaries are buying them, using the engine for all kinds of work about the place. No experience is required to operate the engine if directions are followed.

Packages for Extracted Honey.

For local retail trade, glass packages, such as bottles, jars, tumblers, etc., are undoubtedly the best, although some prefer to use tin cans with suitable labels on the outside. Since honey is a high-class product, however, most producers prefer to put it up in glass for retail trade. There are various styles of very popular glass packages, as shown in the accompanying illustrations. Some prefer to use jelly tumblers and Mason jars, as these can be utilized afterwards by the purchaser, while others use jars and bottles especially for honey. In any case, an attractive label is highly important. A cheap looking label, or none at all, kills sales, while characteristic labels prove to be good advertising.

every time. We have a special label catalog, which we are pleased to mail on request, which shows a large number of different styles of labels, and gives

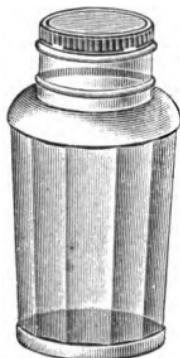


Fig. 23.
Taper Panel Jar.

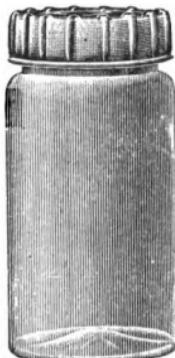


Fig. 24.
Simplex Jar.



Fig. 25.
Tip-top Jar.

prices and full information in regard to them. This catalog being printed in colors gives an exact representation of the labels, as they are, so that one



Fig. 26.
Half-pound Tumbler.



Fig. 27.
Mason Fruit Jar.

knows just exactly what he wants to get, how much it will cost, etc.

An increasing number of producers are selling candied honey either in Aikin honey-bags or in the brick form, as per illustration. To fill the bags, honey that is about to candy is run into them and they are set away until solid. To prepare the honey



Fig. 28. Aikin Bag for Candied Honey.

for the other style of package it is allowed to candy solid in 60-lb. cans and then the tin cut away and the large cake of honey cut up into small "bricks" with wires, preferably arranged in a regular butter cutter. The bricks are wrapped in parchment paper and then in the outside wrapper. It must be remembered that the general public, as a rule, in most localities, is not educated to the use of candied honey and this branch of the trade has to be built up gradually as a matter of course.

For shipping light honey in large quantities the square 5-gallon tin cans are preferable to any other

package. For darker honey, barrels or casks may be used. Sometimes second-hand 5-gallon cans or barrels may be purchased at half price or even less, but nine times out of ten it is cheaper in the long run to use new ones. Old cans and barrels so often leak or spoil the honey.

In using barrels, the hoops should be driven on firmly before the honey is put in, and after filling a further examination is desirable. A barrel should never be soaked with water to make it tight. A

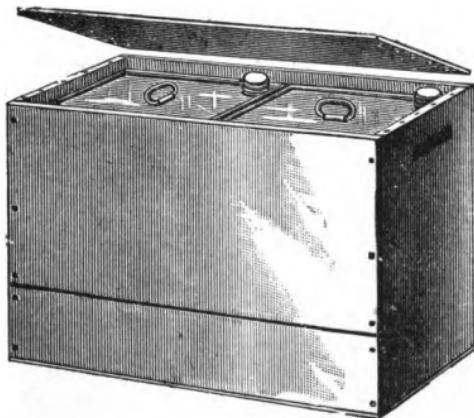


Fig. 29. Five-gallon Square Cans, Two in Wooden Case.

leaky barrel will never swell in time and the honey stop leaking,—water and a good many other liquids may have this effect, but honey never causes a stave to expand. For this reason, and on account of its weight and peculiar consistency it will find a leak where any other substance would not. Coating the inside of the barrel with paraffine or wax helps matters greatly. Some use second-hand alcohol barrels. These are usually well made and are coated

on the inside which prevents leakage. If one head is taken out and the barrel thoroughly cleaned it will answer the purpose well enough.

Each barrel should be filled to within about an inch of the bung-hole, the bung wrapped with burlap and driven in as far as it will go without splitting the staves. If any of it projects, it should be shaved off so as to bring it level with the staves. When this is done a strip of tin should be tacked over it. Also a few tacks should be driven around the hoops to prevent them from falling off. The barrel will then be ready for shipment.

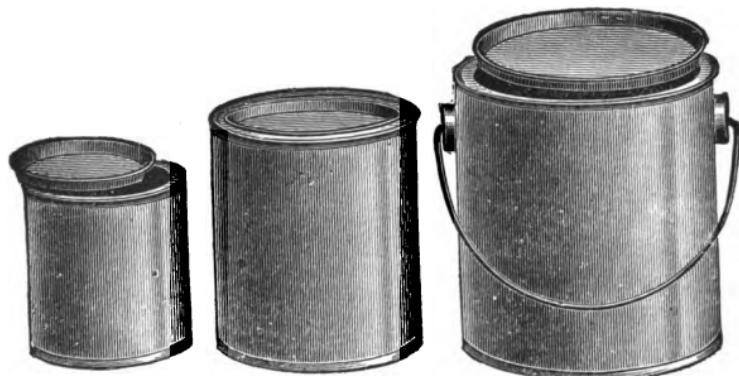


Fig. 30. Friction-top Cans and Pails.

In a great many localities the climate is so warm and dry that it is next to impossible to use barrels for honey with any degree of satisfaction. In such places the 60-lb. square cans should be used even for the dark honey. These are generally shipped two in a case. It is well to fill them nearly full and press against the sides in such a manner that the air is excluded and the honey comes up flush with the top of the hole. Then if the cork is put on and

the cap screwed down very firmly, bulging on the part of the tin is largely prevented. The tin cans are somewhat more expensive than barrels, but the difference in price is nearly offset by the non-leakage of the former and by the extra price obtained for the honey put up in them.

Price List of Supplies Mentioned in this Booklet.

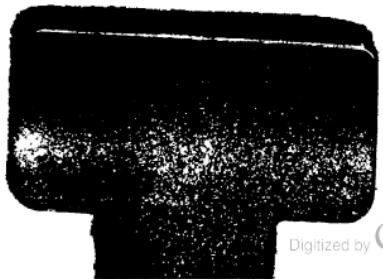
**Figure
Number**

5—Hoffman frames, in flat.....	\$3.00 per 100
6—Metal-spaced frames, in flat.....	3.50 per 100
4—Wood-wire honey-board, 10-frame....	3.50 per 10
" " 8-frame....	3.00 per 10
7—Coggshall bee-brush.....	15c; by mail, 21c
8—German bee-brush, white	30c; by mail, 35c
" " black	25c; by mail, 30c
9—Porter bee-escape.....	\$.20
10— " with board.....	.35
18— " house-escape25
11—No. 2 cart with box.....	10.00
12—Comb-bucket, L. size.....	1.25
14—No. 15B two-frame Cowan extractor, L. size	12.50
No. 17B same with 12-inch comb-pocket....	13.50
15—No. 25B 4-frame Root automatic extr., L. size	26.00
No. 27B same, 12-inch comb-pocket	29.00
16—No. 40BP 8-frame same, power gear, L. size.	46.00
1-h.-p. engine without fan.....	60.00
" " with fan.....	65.00
17—No. 54 four-frame Novice extractor, L. size.	14.00
No. 74 same, 12-inch comb-pocket	16.00
20—Improved Bingham knife75c; by mail, .85
20½—Steam uncapping-knife with rubber tube ..	5.00
Same, by mail.....	5.25
21—Uncapping-tank	15.00

22—Large capping-melter with frame, no stove or separating-can.....	11.00
Two-burner wickless oil-stove.....	4.00
Two-burner gasoline-stove.....	3.50
23—½-lb. Taper-panel jars, per case 2 dozen.....	80
Six cases.....	4.50
1-lb. Taper-panel jars, per case 2 dozen	1.00
Six cases.....	5.70
24—1-lb. Simplex jars, per case 2 dozen	1.10
Six cases.....	6.30
25—½-lb. Tip-top jars, per case 2 dozen.....	1.00
Six cases	5.70
1-lb. Tip-top jars, per case 2 dozen	1.10
Six cases.....	6.80
26—½-lb. tumblers, case 4 doz., \$1.00; bbl., 30 doz.	6.00
29—60-lb. cans, 2 in a case, 85c; 10 cases.....	8.00

Send to THE A. I. ROOT CO., MEDINA, OHIO,
for more complete price list.

Above prices subject to change.



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